

```
external.penalty <- function (f,penalty,x,alpha,tol) {  
  repeat {  
    objective <- function (x) {f(x) + alpha * penalty(x)}  
    new.x <- newton.armijo(objective,x,0.5,0.5,tol)  
    alpha <- 2*alpha  
    if (dist(rbind(new.x, x)) < tol) {  
      return(new.x)  
    }  
    x <- new.x  
  }  
}
```